

# Reduced Vibration Power Tools

## The Problem

From chainsaws to impact drills to soil compactors, some hand-held power tools can produce a lot of vibration. Certain tools generate vibration levels so high that they can damage the blood vessels and nerves in your hands.

The problem usually begins with numbness and tingling in your hands. After you have been exposed to vibration for a while, your fingertips may become discolored or white, especially when they get cold. You may also lose grip strength. In extreme cases, gangrene is possible. This injury is sometimes called “white finger” or “hand-arm vibration syndrome” (HAVS).

You are at greater risk of developing a vibration-related injury if you use vibrating power tools often or for long periods of time. These injuries can be prevented, but there is no cure once you have them.

*Problem: Some soil compactors can produce high vibration levels*



*Solution: Use reduced vibration tools with anti-vibration gloves such as these air bladder gloves*



## One Solution

Use **reduced vibration power tools**. Many tools are now available that are designed to produce less vibration. They should always be used with full-fingered anti-vibration gloves that are certified to meet International Organization for Standardization (ISO) vibration standards (ISO 10819). Gloves that are not ISO-certified may not reduce vibration adequately, even when using a tool designed for low vibration.

Always keep your hands warm when using any vibrating tool, and use as light a hand grip as possible. Using a lighter grip helps reduce your exposure to vibration.

## How It Works

Many manufacturers now offer reduced vibration tools. Although there are no regulations limiting vibration exposure in the U.S., there are limits in Europe and companies produce tools for both markets. The European limits have been adopted by the American National Standards Institute (ANSI) as recommended exposure limits (S2.70-2006).

The possible harm caused by operating a vibrating tool is related to the *level* of vibration and the *amount of time* the tool is used. The higher the vibration level, the shorter the time the tool can be used safely. In 2002, the European Union limited ISO frequency-weighted vibration exposure to an average of 5 meters per second per second ( $\text{m/s}^2$ ) over any 8-hour period. For example, use of a tool with a high level of vibration ( $10 \text{ m/s}^2$ ) would be limited to a shorter period (2 hours per day). For text of the European regulation search for “Directive 2002/44/EC” in any Internet search engine.

The National Institute for Working Life in Sweden lists vibration levels for hundreds of specific power tools on the web (go to <http://vibration.niwl.se/eng>). Vibration measurements are approximate, not absolute. They can vary depending on how the vibration is measured, how the tool is being used, and the condition of the tool. Also check users’ manuals for vibration information.

If you know the vibration level of a tool, you can determine how much time you can safely use it. (This is called “trigger time.”) There are several vibration exposure calculators on the web. If you enter a tool’s vibration level (in  $\text{m/s}^2$ ) the calculator will tell you the trigger time. Vibration exposure calculators can be used to help determine whether the tool you use produces too much vibration. Calculators can be found online by using the following search terms: “vibration exposure calculator.”

## Benefits for the Worker and Employer

Reduced vibration tools allows workers more “trigger time” with less risk of injury. Where trigger time limits are enforced by the employer, using reduced vibration tools may also increase productivity. Using anti-vibration gloves alone may not eliminate exposure to all harmful vibration.

## Approximate Cost

Reduced vibration power tools are available for purchase and rental. Contact the tool manufacturer or representative for prices. Anti-vibration work gloves usually cost \$40–50.

## For More Information

- Products related to this solution are described at [www.cpwr.com/simple.html](http://www.cpwr.com/simple.html). Products also may be found on the internet using the following search terms: “low vibration tools.”
- Local contractor tool and equipment suppliers or rental companies may be another source of information on products.
- For general information on this solution, check [www.cpwrconstructionsolutions.org](http://www.cpwrconstructionsolutions.org) and [www.elcosh.org](http://www.elcosh.org). Information, including additional vibration exposure calculators, is also available from the Canadian Center for Occupational Health and Safety (CCOHS) at [www.ccohs.ca](http://www.ccohs.ca).